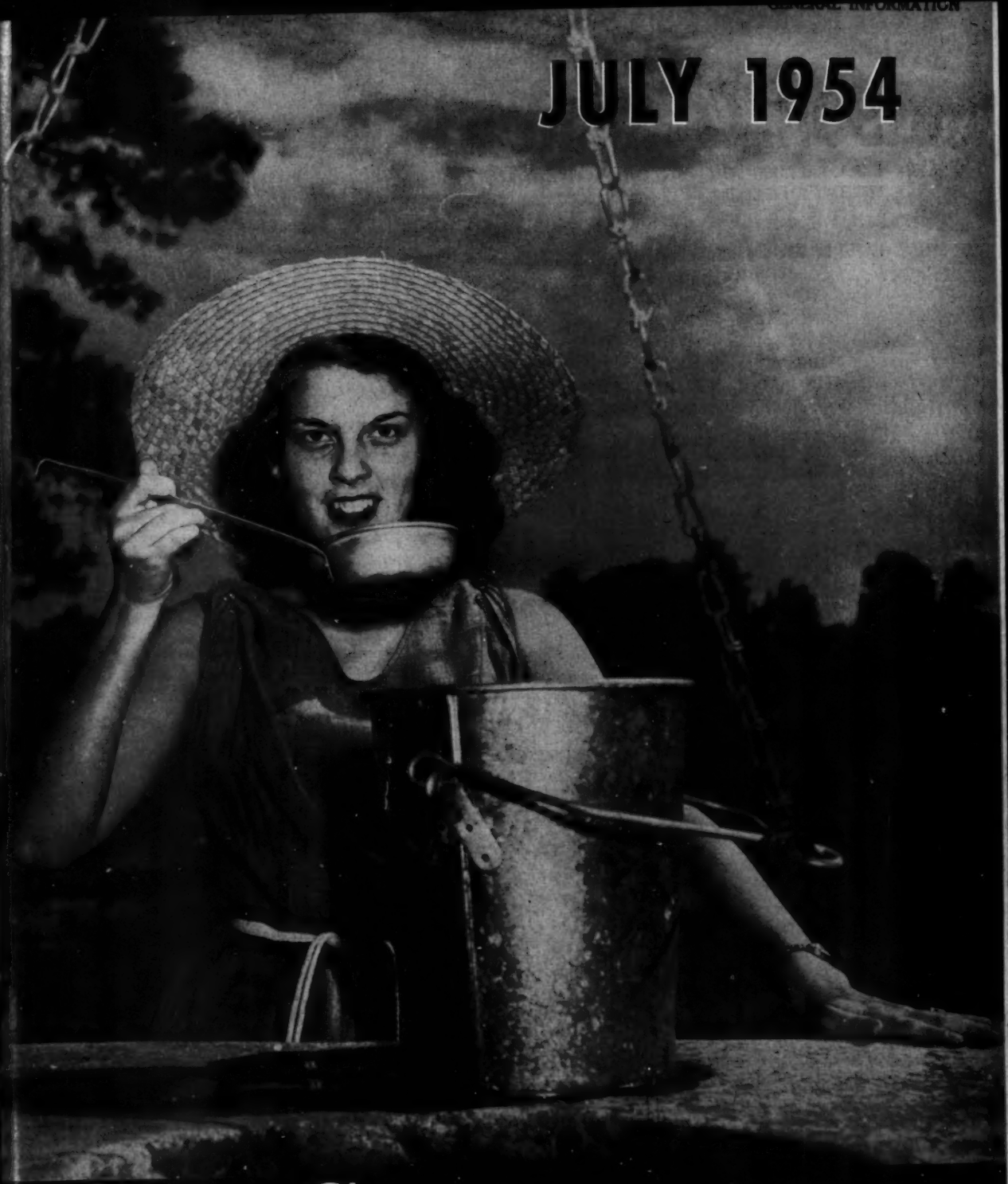
JULY 1954



SOIL CONSERVATION

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EZRA TAFT BENSON
SECRETARY OF AGRICULTURE

DONALD A. WILLIAMS
ADMINISTRATOR, SOIL CONSERVATION SERVICE

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★ THIS MONTH ★

WELLINGTON BRINK
Editor

SOIL CONSERVATION is published by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business, under approval (August 6, 1951) of the Director of the Budget. SOIL CONSERVATION supplies information for workers of the Department of Agriculture and others engaged in soil conservation.

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ALL-AROUND PROGRESS. — The man who practices good soil conservation is, in most instances, the man who has a good home, a well-kept farm, and a high standard of living, says County Agent D. C. Wylie, Jr., of Chester County, S. C.

"In Chester County," says Wylie, "the type of agriculture has changed in the past few years from almost strictly row-type to more pastures and close-growing crops to support the growing livestock industry.

"The Soil Conservation Service and the Extension Service have worked hand in hand on promoting this kind of agriculture, both for the sake of the soil and for better farm living."

LEAGUE'S CHOICE.—*Virginia Wildlife*, the official publication of the Virginia Commission of Game and Inland Fisheries and edited by J. J. Shomon, has been picked by the Izaak Walton League of America as the best state conservation magazine in the nation.

GRASSLAND INTEREST. — Over 200 Waukesha County, Wis., farmers plan to renovate pastures. Many have taken soil samples.

FRONT COVER.—Water is a universal need. And it is one of South Carolina's greatest resources. Soil conservation districts are working to conserve water at the same time they conserve soil. This photograph by J. B. Earle, of Route 5, Lancaster, S. C., was made on a hot day in July last year.

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Reshaping New England's Farms

By ARTHUR B. BEAUMONT

Farm pond for irrigation and fire protection.

REVOLUTION in the agriculture of New England began a little over a century ago with the inventions of the mowing machine, the self-binder, and the steel-bottom plow. Prior to that time, in New England, as well as elsewhere in America and Europe, agricultural implements and methods were almost of Biblical primitiveness. The use of commercial fertilizers quickly followed the introduction of improved machinery. The march of progress in agriculture had started, and advance after advance has occurred through the years. The most recent significant development has been the reshaping of New England's farm lands through the application of soil conservation and land improvement practices.

The introduction of labor-saving machinery reduced the drudgery of farming and increased the output per man but, in most cases, not the yield per acre. Nathanial Shaler, professor of geology at Harvard University at the turn of the last century, in his book, "Man and the Earth," stated that he considered the use of commercial fertilizers the most significant and important advance of the preceding half-century.

Because of the methods of their formation and a great variety of parent rock materials, New England has numerous soil types, among which may be found those that are suited to the growing of any climatically adapted crops. But they are characteristically low in plant nutrients. Having good physical properties and receiving generous rainfall, these soils respond especially well to fertilizers and other supplements, including lime. Prior to the introduction of commercial fertilizers, only low-grade materials such as composts, peat, seaweed, animal manures, and wood ashes were available.

Residents of Massachusetts played important roles in the early history of the fertilizer industry. In fact, the so-called "complete" fertilizer was an invention of Levi Stockbridge, the first professor of agriculture at Massachusetts Agricultural College. The Stockbridge fertilizer formulas became famous in New England. They carried nitrogren, phosphoric acid and potash in proportions thought to be best for growing certain crops. Before the introduction of the complete fertilizer, plant nutrients were applied individually in commercial carriers such as nitrate of soda and superphosphate. William H. Bowker, one of Stockbridge's students, became a leading early manufacturer of commercial mixed fertilizers.

Removing field stones from cropland in Maine.

Note.—The author is state conservationist, Soil Conservation Service, Amherst, Mass.

Tobacco growing in contour strips with terraces, Connecticut River Valley, Conn.

Through the work and influence of the land-grant agricultural colleges, the experiment stations and later the Extension Service, the farmers of New England kept abreast of the latest developments in applied agricultural sciences and technology. Adjustments in land use and cropping systems were made to meet changing conditions and competition. Wheat growing all but disappeared. Specialty farming developed in certain localities, such as potato growing in Aroostoock County, Maine, tobacco farming in the Connecticut River Valley, and cranberry culture on Cape Cod. Yields of crops equaled or exceeded those of other sections. More corn per acre sometimes is grown in Connecticut than in Iowa, and more tobacco per acre in Massachusetts than in North Carolina.

New England, especially the southern part, is generally considered to be an industrial area. It is that, but it is also more agricultural than is commonly known. According to the 1950 census three of the five leading states in value per acre of crops harvested were in New England. Of the three thousand-odd counties in the United States, one New England county ranks 16th and another 26th, in the value of all farm products sold in 1949. A number of other New England counties rank very high in the value of certain farm commodities sold. Yet the agriculture of the area is more intensive than extensive. With the exception of a few places like the Connecticut River Valley, broad, level acres free from stones and stonewalls are conspicuously lacking.

The farms of New England supply only a part of the total food requirements of its population of nearly 10 million. In 1949 there were 91,287 farms on 12,104,788 or one-third of the

A cranberry bog in Massachusetts.

Harvesting contour planted, stripped potatoes in Aroostook County, Maine.

Stripcropped potatoes (dark) and oats, as seen from the air, Maine.

Contented cows on improved pasture in Vermont.

36,399,412 acres in the area. The remaining two-thirds is devoted to forests, cities, highways, and other non-agricultural uses. Recreation has become big business. This creates a demand for more food.

The most recent step in the evolution of New England's agriculture has been the reshaping of its farmland for soil and water conservation and more efficient use of power machinery. This, in many cases, was all that was needed to round out a balanced program of production. Organized, systematic work in soil conservation was started in New England in 1939 with the passage of the Vermont soil conservation districts enabling act. Within 6 years all the other states of the area had passed similar acts. The creation of local, autonomous districts occurred rapidly, so that New England with 64 districts is completely covered except for one county and part of another in Maine. These districts are controlled by locally elected supervisors, and the Soil Conservation Service cooperates by supplying technical assistance.

Progress made in these soil conservation districts within their comparatively short life has been highly gratifying. From Lake Champlain to Cape Cod, and from Aroostook County to the lower Connecticut River Valley, farmers are availing themselves of the technical assistance obtainable through districts. The total number of farmer cooperators was 30,762 at the last count and their acreage totaled 4,495,360. Thus, about one-third of all farmers and one-third of the farm acreage have been brought into the program.

Thirty-six conservation and related land improvement practices are used in conserving and improving New England soils in addition to those involving the addition of lime, fertilizers and manures. They are standard practices developed by the Soil Conservation Service and differ from those used in the South and West mainly by greater use of vegetation and less of structures. Much use is made of grass, trees, and shrubs. In order to give a better idea of the kind of practices and the extent of their use, some of the more important accomplishments as of June 1953 are listed below:

Contour farming	acres	89,311
Stripcropping	acres	48,504
Terracing	miles	43
Diversion construction	miles	509
Grassed waterways	acres	784
Constructed outlets	miles	753
Streambank erosion control	miles	94
Tree plantings	acres	14,213
Windbreak plantings	miles	69

Land clearing	acres	39,141
Obstruction removal	acres	70,002
Open drains	miles	897
Covered drains	miles	120
Ponds constructed	number	3,423

The application of practices of soil and water conservation and related land improvements is thus enabling New England farmers to put their physical plant in good order for maximum production. These practices in many cases were all that was required to balance the program of production. The establishment of conservation practices assures the continuation of the production program through the years with a minimum soil loss or deterioration. State and county agricultural extension services, agricultural experiment stations, the Soil Conservation Service, the Agricultural Conservation Program Service, and other Federal and State agricultural agencies, including soil conservation districts, are playing important parts in this resurgence of New England's agriculture.

Henry J. Steinberger.

DISTRICT PROFILE

STEINBERGER of NORTH DAKOTA

"We as tillers of the land must enlist support from those who are users of the land to help put our program of conservation across to the people."

This is a familiar statement by Henry J. Steinberger, outstanding soil conservation district supervisor of Renville County, N. Dak.

Steinberger came from Wilkin County with his parents in 1902. They homesteaded in old Imperial Ward County, which later divided into Ward and Renville Counties with the Steinberger homestead in the latter. Henry's son, Jack, is a partner in farming operations. They have been in conservation farming since the start of the district, and they are especially proud of the several miles of live snow fence plantings which are part of their conservation plan.

It was largely through the efforts of Henry Steinberger that the Renville County Soil Conservation District was organized in 1944. From the outset he has been a supervisor "spearheading" the district's program. In 1952 the board's membership—Melvin Duerre, H. M. Hansen and Steinberger—were State winners in the Goodyear Tire and Rubber Company contest for district supervisors' achievements. They spent a week at the Goodyear farm in Phoenix, Ariz.

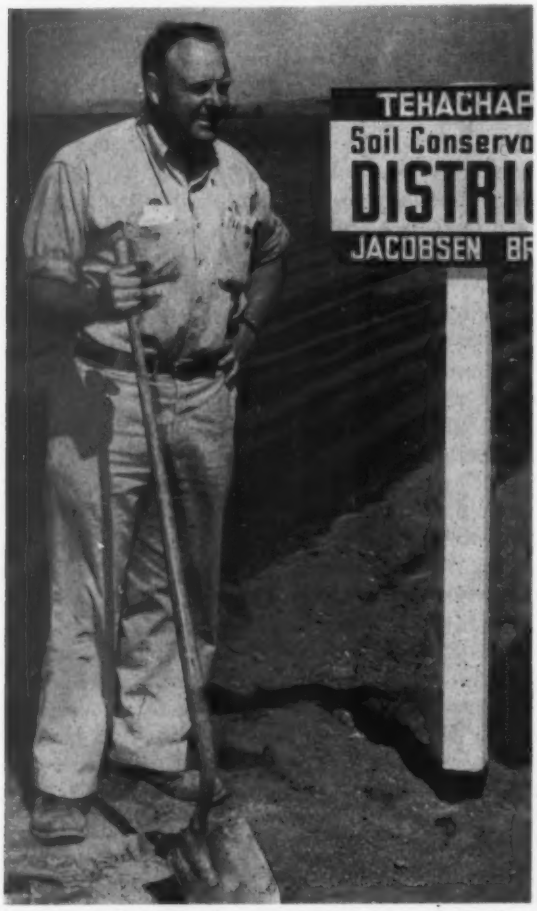
Henry is very active in affairs of the district, state association, and the national association. In 1952 as president of the North Dakota State Association of Supervisors, he and the state association officials placed in their program of action a request of the Governor of North Dakota to designate a Soil Conservation District Week. The committee asked supervisors throughout the State to contact their local clergymen on the week and suggest they preach sermons on conservation. The response was excellent and from this emerged an effective conservation spokesman, Rev. Walter Forred, of the Federated Church of Lisbon, N. Dak., who is dedicated to the rural life work of the church. Through Steinberger's encouragement, Rev. Forred has appeared as speaker at nearly all of the area supervisors meetings in the State; last summer at the North Central Regional

(Continued on page 285)

DISTRICT PROFILE

J. C. JACOBSEN, JR.
of
CALIFORNIA

OLDTIMERS gaze in awe at the crops growing today in Sand Canyon near Tehachapi, Calif. Only 10 years ago the area was waste ground covered with rocks. J. C. "Jake" Jacobsen, Jr. has been very instrumental in changing rock-strewn, submarginal, idle ground into an area that is very productive. An important factor that made this economically feasible was the construction of a machine to pick the rocks from the ground and load them onto a truck. Hand labor was prohibitively costly.



Jacobsen with the trademark of the western irrigation farmer; a long-handled spade.

Jake started farming for himself in 1929 at Twin Falls, Idaho, having worked on farms several years previous to that date. While there, he was engaged in growing potatoes, corn, truck crops, forage crops, and raising cattle. A working knowledge of conservation farming was gained through experience on the rolling fields of that ranch. As he says, he was forced to practice conservation measures there. In 1941 Jake and his family moved to Tehachapi and established their home where it has been maintained until the present time.

In 1947, the board of supervisors for Kern County, passed a resolution creating the Tehachapi Soil Conservation District. The following directors were elected: J. C. Jacobsen, Jr., Sam Iriat, and Al Bailey, all of Tehachapi. At the organizational meeting held February 4, 1947, Jake was elected president of the board of directors of the district, a position he has held ever since. Jake's voice has frequently been heard telling of the benefits derived from a district, and giving encouragement to groups sponsoring the formation of other districts nearby.

Jake is civic minded, and does his part to improve the farmer's lot and make the community a better place in which to live. He has held many responsible positions: chairman, Tehachapi Union High School Board of Education; director, Bank of Tehachapi; mayor, City of Tehachapi for 4 years; member of the City Council of Tehachapi for 6 years; chairman of the Boy Scout Committee for 2 years; scoutmaster for 3 years; president, Kern County Potato Grower's Association; president, Kern County Seed Potato Association; director, California Crop Improvement Association, representing 7 California counties; director, National Potato Council, and director, National Potato and Onion Association.

Jake's first love, however, is down-to-earth work on a ranch, growing plants and raising cattle, at which he is a top-notch performer. Largely through his cooperation with the University of California and the Soil Conservation Service in testing seed production under actual growing conditions, the following crops were introduced into the Tehachapi community: sugar beets, Atlantic alfalfa, Narrangansett alfalfa, Ranger alfalfa, Kenland red clover, Mer-

This is how Jacobsen irrigates his potatoes.

ion bluegrass, Goar's tall fescue, and Okaroa orchardgrass. This work is a continuing process with Jake and he has many grasses and legumes now growing and being tested for seed yields.

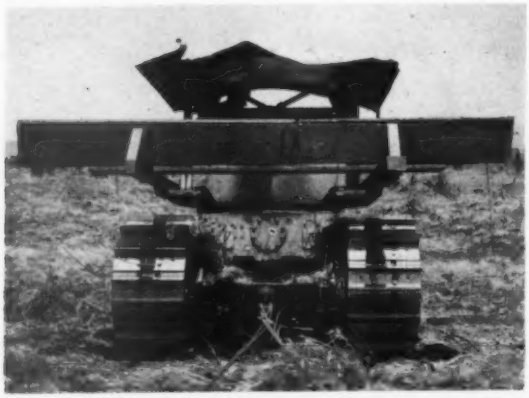
Jake's interest in conservation can be grasped readily as one visits his ranch. If you are a newcomer, you are amazed at the many conservation measures established there. The first conspicuous one is contour furrow irrigation and farming. One field is producing potatoes in contour grade rows, another field, sugar beets; another, grasses; another, legumes. Looking to the windward side of one of the cultivated fields, you see a nice green windbreak of Arizona cypress, while an area nearby which is unsuited for cultivation has been planted to black locust seedlings. As you approach the outer limits of his ranch, you reach a spot where runoff water from the mountains tends to concentrate. There you find a vegetated waterway constructed and seeded to prevent excessive erosion. The vast expanse of grasses and legumes spreading before you is inspiring, as you realize that those acres are being well protected from water and wind erosion. Another very noticeable conservation practice is the use of portable irrigation pipe. Jake informs you that they are used to regulate length of irrigation runs. They have spaced gated outlets and can be placed in any portion of the fields, thus bringing water in any desired amount to the sections needing it. This means even distribution, proper application, and penetration of irrigation water for all crops, and an important conservation of water.

"Our average production per acre on all crops has been increasing throughout the 6 years of participation in the soil conservation district program," Jake declares. "The farmers in our district are able to keep local control of the conservation program through the farmer-elected

(Continued on page 288)

Growing Narragansett alfalfa the Jacobsen way, in contour grade rows. Irrigation water being applied.

Simple Seeder for the Range



The "Johnston seeder" as mounted on the rear of a tractor.

By ROY L. SHIPLEY

A HOMEMADE, low cost grass-legume seeder for use on brush-cleared rangelands has been devised by Allan P. Johnston, manager of the Kappapala Ranch, Hawaii.

Johnston, who is chairman of the Kau Soil Conservation District, worked out the seeder after years of wrestling with range-seeding problems. The seeder has real promise because it is inexpensive to build and keeps planting costs down.

The seeder box or hopper is constructed very much after the pattern of a seeder box on most conventional drills. The box is about 12 feet long and about 12 inches deep. At the top it is 12 inches wide and tapers to about 4 inches wide at the bottom. The box was constructed of unplaned lumber 1 inch thick.

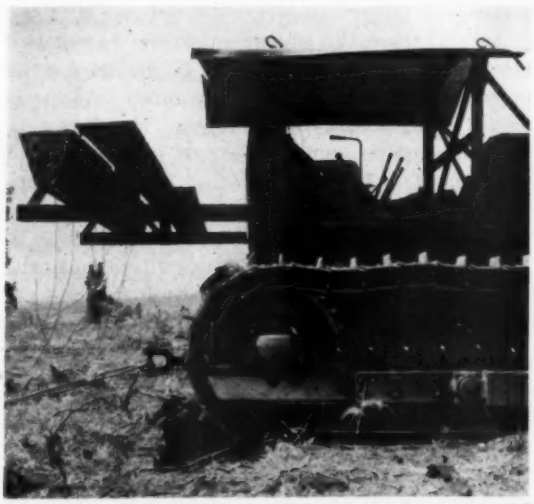
Feeder openings bored through the bottom of the hopper are about 3/4 inch in diameter and are spaced 16 inches apart. The box is separated into small compartments by wooden dividers intended to prevent the grass and legume from sliding to one end on rough terrain or when traveling on a slope. The dividers are fastened midway between the "puka" openings.

A ½-inch pipe runs the entire length of the seeder box and is mounted in the top center so that the lid can be closed without binding on the pipe.

Note.—The author is range conservationist, Soil Conservation Service, Territory of Hawaii.

The problem of getting grass seed to flow evenly through feeder openings was overcome by the use of 6-gauge galvanized wire, about 4 or 5 feet long. It runs through the feeder openings and is fastened at the top to the ½-inch pipe mounted inside and near the top of the box. The pendulum motion of the wires aids in a steady flow of seed through the openings

In calibrating the seeder to seed the proper number of pounds per acre, 3 holes of 3/8-inch,



Broadside view showing seeder mounted on rear of vehicle, well above rocks, brush and rough terrain.

7/16-inch and ½-inch diameter and about 2 inches apart, were bored through pieces of heavy tin 2 inches wide and 6 inches long. The 2″ x 6″ tin plates were then slipped over the wire through the size of opening desired, and fastened by small screws exactly over the 3/4-inch hole drilled through the bottom of the hopper.

Calibrating the seeder to drop enough, but not too much, seed was a sticker until Johnston hit on an idea. The gimmick was a 2-pound coffee can with a hole in the bottom large enough to slide upward over one of the wires hanging below the seeder. The can was then tied against

the bottom of the hopper so as to catch all the seed coming through an opening.

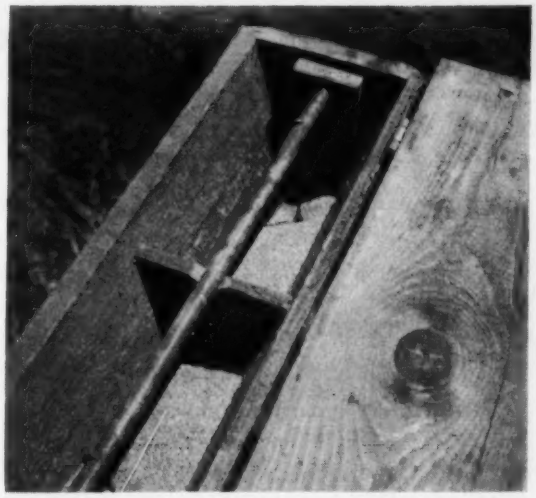
Johnston operated the seeder over a distance of about 1,000 feet. Seed collected in the coffee can then was weighed and multiplied by the number of openings in the drill. Thus, it was possible to calculate the amount of seed being dropped per acre. When too much seed was going through an opening the metal plate was moved so that a smaller opening was in place.

The first seeder worked so well that Johnston made a second one. This took less time and money to build. The cost now is estimated at $25 for labor and materials. Both models are inexpensive but effective.

The first seeder was mounted on 4" x 4" timbers on the back of a D-8 caterpillar tractor at about the same height as the driver's seat. The seeder is suspended about 5 feet above ground, well away from rocks, brush and rough terrain. It is relatively free from repairs and after a month's operation none were necessary. A few slight improvements were made after testing.

Johnston explains that the second seeder mounted on the back of a D-4 crawler tractor did not seed at the same rate as the one behind the D-8 tractor. The speed at which the seed drops through the seeder openings is dependent upon vibration of the tractor and the movement of the wires. The seed automatically quits

Bottom of seeder, showing metal plates and wire emerging from hole.



Looking down on seeder with lid open. Divider boards are spaced about 16 inches apart to keep seed from sliding to one end on sidehills and steep slopes.

flowing once the machinery is stilled. The second model was calibrated to seed the right amount by changing to the proper opening in the metal plate and again securing the plate to the bottom of the hopper.

The seeder broadcasts the seed. A dragging chain covers it. Observations of germination and stand on some of the earliest seedings show a surprisingly uniform stand of growth. Johnston sums up results this way: "The stand is much more uniform than when seed was broadcast by hand and there is a considerable saving in labor. Now one man does a better seeding job than three men did before. This is accomplished by seeding and covering the seed in one operation."

THREE-WAY CROP.—Sericea lespedeza is almost a sure crop, according to Walter M. Atkinson, a farmer of the Chester (S. C.) Soil Conservation District, who points out sericea may be used for hay, grazing, or seed.

"As for me, I prefer a seed crop," Atkinson says. "The price has been good since I started growing sericea 4 years ago. But if a farmer prefers a hay crop, he can get it plus, in all liklihood, a second crop for seed.

"Of course, if sericea is used for grazing, it is not likely to produce either hay or seed unless the grazing is carefully controlled."

Scout Leaders Get Special Training

WHEN President Eisenhower suggested that the Boy Scouts of America perform a National Conservation Good Turn in 1954, he set in motion a tremendous force of energy on the part of Scouts, Scout leaders and conservation leaders. President John M. Schiff of the Boy Scouts of America appointed a committee to work with conservation technicians of federal, state and independent agencies.

Of primary importance is the fact that the committee recognized that conservation is now a science. Many thousands of professionally trained conservationists in the field stand ready and willing to help and guide in conservation activities. Some of the problems in conservation work being faced today are the result of ill-advised and ill-planned activities in the past. In setting up the program so as to be of greatest benefit to the country, the committee geared it to the locally-planned operations of the professional conservationists. They listed all of the agencies where Scouts and Scout leaders could get help. Among them were the local soil conservation districts and the Soil Conservation Service. The supervisors of such districts knew the value of having farmers, through their own efforts, carrying out well-planned and sound soil and water conservation programs. They felt the same should be true of the Scouts and Scout leaders.

The committee of the Tomahawk Council, Coshocton, Ohio, applied to the supervisors of the Coshocton County Soil Conservation District for assistance in setting up a conservation program at the Council camp. It was apparent that many of the Scout leaders in the Council were eager for training in conservation principles so that they could better help the Cubs, Scouts and Explorers on the Conservation Good Turn in 1954.

M. Harrison "Doc" Taylor, Soil Conservation Service training center supervisor, being a post advisor and having two sons, Craig and Paige, in Scouting, was invited to discuss the Conservation Good Turn in 1954 with the Council camping and activities committee by Chairman, R. R. "Casey" Jones. Taylor and George N. Osterson,

Top—State Forester Moyles was an effective teacher.
Center.—Soil Conservationist Morris talks about stripcrops.
Bottom.—Taylor, training center supervisor, discusses wildlife.

assistant training center supervisor and member of the department conservation committee of the American Legion, helped the committee arrange a conservation training session designed not only to assist the Scout Leaders acquire information and techniques on projects the units could carry out, but provide them a clear-cut picture of the work being carried out in soil conservation districts throughout the Nation.

In the meantime the camping and activities committee was developing a soil and water conservation plan for the Council camp with the assistance of Glenn Morris, soil conservationist of the Coshocton County Soil Conservation District. They planned to use the camp in such a way that each acre of land would be used according to its capability. Those conservation practices which would insure adequate protection and development were worked into the plan.

The National Council felt that a good time to start the "Boy Scout Conservation Good Turn in 1954" would be Wild Life Week, in March. Climax activities are suggested for the month of October.

It would not have been difficult to have had a hundred Scout leaders at the one-day training session. However, one of the best ways to learn principles is to teach them to someone else. It was decided to hold the group to 50 in order that everyone attending would have a chance to discuss conservation principles in detail. They could, in turn, train other Scouts and Scout leaders.

The SCS training center is 9 miles northeast of Coshocton at the USDA Soil and Water Conservation Research Station. All new SCS employees of Midwest States attend the center to receive training in basic conservation principles. Since there were no trainees at the center, it was picked for the training of Scout leaders.

The center has the facilities to demonstrate and exhibit all major soil and water conservation practices. It was an ideal training site for Scout leaders. Almost any other district in the country could locate a good site for a training session this year.

Through the efforts of the supervisors of the Coshocton district, and Robert Calvert, Scout Executive of the Tomahawk Council, men trained in conservation work were recruited to plan and carry through the project. Taylor was chosen general chairman. Glenn Morris, local soil conservationist, and Lloyd Harrold, project supervisor in research, handled the training. Morris showed the importance of land capability. He explained the uses of certain conservation measures: Grassed waterways to carry excess water from a field; contour farming on fairly short slopes to prevent washing and allow water more time to enter the soil; terraces to take off excess water so it will not damage the land below; diversions at the proper place to break a long slope and protect bottom or hill ground from too much water; stripcropping to make it possible for the land to be covered with grass

Scout Leaders get outdoors for Bob Yonker to show some principles of tree planting.

and legumes at least 50 percent of the time, and to give protection on short slopes; tile drainage to remove excess water from the soil so it can be replaced by air for the plant roots to grow.

Lloyd Harrold explained the water cycle and showed how important it is to have the soil in a condition to absorb the rain. He took the group to the lysimeters to observe the method used at the research station to obtain information on ground-water movement. A lysimeter is made up of an undisturbed block of soil 8 feet thick, with provisions made to measure what happens to every drop of water that falls on it. The area is one five-hundreths of an acre in size and the entire block weighs 130,000 pounds. One of each battery of three lysimeters is set on a scale sensitive enough to weigh the dew, where the weight is recorded automatically every 10 minutes. This makes it possible to know exactly what happens to each raindrop that falls. Methods of securing other information on ground temperatures, water runoff, erosion and evaporation were explained. The Scouters could see the importance of having dependable research back of the science of conservation and realize the necessity of getting it into the hands of farmers and conservationists.

R. E. Youker, a research man and a forester by training, discussed the projects set up to be carried out in that field. He stressed the importance of planting trees on properly adapted soil. The portion of a tree, the roots, which we don't see, play a most important part in its support, health, condition and form. Exhibits of cross sections of logs showed the effects of fire and shading, the influence of site on growth, and damage caused by fencing. Many of the Scout units plan tree planting projects, and Youker showed them how to organize their groups for planting to get uniform distance between trees.

Sheets showing the types of trees to remove under woodland management were handed to the Scouters so they will have illustrations for their charges. There was fieldwork in a woodlot in the afternoon.

Bill Blanke and Omar Runyan, Scout field executives accepted the responsibility of handling outdoor manners. They obtained the assistance of Walt Moyles, forester at Mohican State Park.

The three worked together around a campsite on the grounds and showed how rubbish should be destroyed, latrines built, grease and dishwater disposed of, and other matters involving "good manners" on a campsite. Moyle showed a section of a white oak tree which had been hacked to death during the past year. He also related instances where good manners are very noticeable among Scouts and people who really understand conservation.

Taylor stressed the need to have a 12-months food supply for wildlife. With proper plantings, the emergency feeding of wildlife after a storm would almost be a thing of the past. Food should be where it is available under all conditions and where wildlife can always find it. It was noted that food, cover and water usually precede large numbers of wildlife. Besides the 12-months food supply, different kinds of cover such as nesting cover, travel cover, resting cover, and night cover must be present.

Dens, burrows, brushpiles may be provided by Scouts for many types of wildlife. Dead trees should often not be cut because of the wildlife use they might have as den trees, nesting trees or food trees.

It was shown that wildlife does not consist merely of those birds or animals hunted by sportsmen but of the many more that help nature keep a balance between injurious and helpful types. Included are many of the snakes, owls, shrews, skunks, and insects for pollinating flowers or destroying harmful insects.

Two farm trailers were used to transport the Scouters to the field in the afternoon to see actual examples of soil and water conservation in operation. On a section of living fence it was

At the one-day training school; this group of Scout Leaders learned fast.

From left—Glenn Morris, Bob Yonker, Walt Moyles, Bob Calvert, and "Doc" Taylor. All are rather proud of this exhibit.

possible to observe many of last year's bird nests and praying mantis egg sacs. It was easy to see that the surrounding area would be protected from insect damage, while the clean fence row did not reveal any type of wildlife whatever.

Various types of tree plantings and woodland management practices were observed and discussed. It was eye-opening to see the men catch the ideas and principles of conservation quickly, and start talking about what their units could do on areas these observations brought to mind.

Scouters attending the session expressed a desire to have more training sessions based on conservation. Plans are being made to hold a Council Conservation Camporee soon, where Scouts will be able to work on conservation projects under the direction and supervision of technicians. Posters and displays to be used around the Council were exhibited and explained during the day.

Next October will mark a month of conservation observations and reports of accomplishments by individuals and units on the Conservation Good Turn in 1934 in Tomahawk Council. It will not mark the end of the conservation work in Scouting but rather a good beginning. Conservation is a major part of Scouting and must be well planned, well organized and well executed for the future of the Nation and Scouting.

—M. HARRISON TAYLOR

NEW PROGRAM.—A combined study program leading to degrees in both business administration and natural resources has been announced by the University of Michigan.

"Where there is no vision, the people perish . . . "

Religion and Conservation

By REV. WALTER A. FORRED

FROM time to time much has been said and written relative to religion and conservation. What, specifically, is the tie-in between the two? This is a question which is asked by many and it deserves a well outlined answer.

If religion is to be vital it must be practical for every phase of life. It must not only give strength for life's giant hours of sorrow and trial, but must also give guidance and assistance in every avenue of human activity. Each act of man is eventually weighed to determine his religious sincerity. By their words, they reflect their relationship to God. If man is to be able to live by religious principles, he must possess a *total gospel for total life.*

Conservation, in all of its phases, must certainly come within the scope of such a total gospel. By his acceptance or rejection of such a stewardship man reflects his attitude toward the creation in which God has placed him. If he accepts such a religious dedication it becomes the paramount choice in a chain of continued choices. To be consistent in his religion, man therefore is bound to make all other decisions in the light of his first choice. This demands that he practice a religious attitude in his stewardship of all things, and certainly of the natural resources. In the light of such reason, man either is conscientious in this application of religion, or he disassociates his religious practice from his workaday world and employs only those practices which will enhance his materialistic possessions. In this respect, there is a definite association of religion and conservation, because it is the objective of every true religion to elevate man's goals until they are in harmony with the spiritual rather than the material.

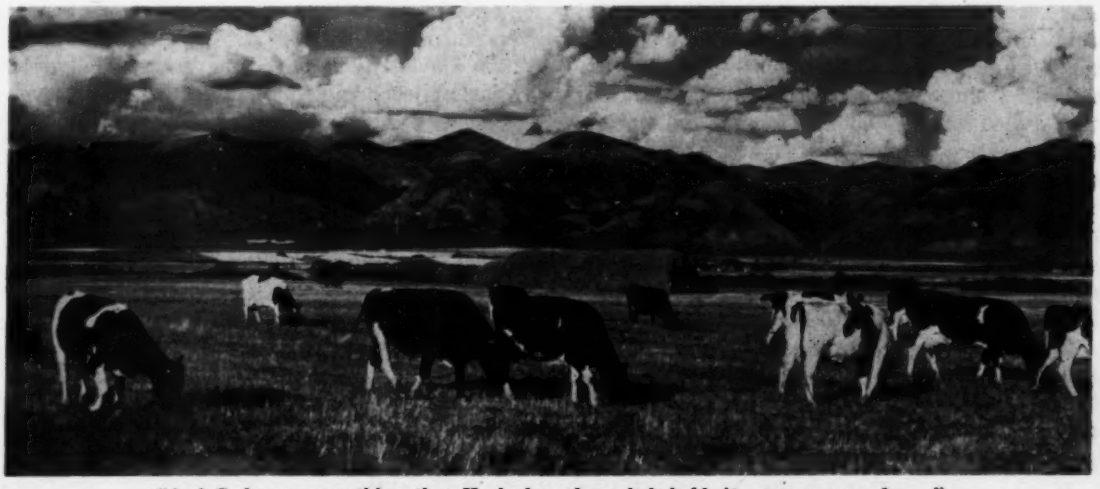
Man's religion is certainly more than making affirmations about God; it must be the practice of such professions in everyday life. The realistic application of this axiom makes religion a stimulant instead of an opiate, and causes man to aspire toward his highest vision. Man's affirmations and professions of faith are truly great. To say, "I believe in God, the Father Almighty, Creator of heaven and earth;" or "The earth is the Lord's and the fulness thereof, the world and they that dwell therein, for He hath founded it upon the seas and established it upon the floods;" to read, 'The heavens declare the glory of God and the firmament showeth his handiwork; day unto day uttereth speech and night unto night showeth knowledge. There is no speech nor language where the voice is not heard;" to sing, "This is my Father's world," or "O Beautiful for Spacious Skies, for amber waves of grain," is to feel the creating presence of God vibrating universally. Such words awaken men to a wholesome moral aggression

in life and are their salvation from the slovenly *status quo* of mediocrity.

In the Bible one finds a library of books, many of which were written in an agrarian background to agrarian people. The teachings of Jesus were couched in the language of the sower of the seeds, the trimmers of the vine and the shepherd of the sheep. This book could be no better understood by any man than the farmer. It certainly speaks with a vivid clarity to those who have witnessed the clouds of dust darken the sun and change midday to midnight when it says, "The wind passeth over it and it is gone and the place thereof shall know it no more." Religion and conservation have an inseparable relation. Either we believe what we profess or we do not. If we do, then it is time for us to treat the earth as a possession of God. If we do not believe our professions, then our religion is a sham, an escape, and worthless.

nothing more than making these laws operative, where possible, in assistance to God and His eternal purposes. Where man breaks God's laws he can expect serious consequences. When he mines the topsoil, depletes the woodlots and forests, uses his equipment to plow gullies into the hillsides, creating erosion, or exploits any of our natural resources, he becomes a threefold sinner. First, as a destroyer of God's possessions; second, as a depletive of his society's wealth and well-being, and third, as a pillager of the health, security, and living standards of our future generations. Surely, the sins of such people will be passed on to their children and their children's children. Religion and conservation *are* tied together!

It is not the job of the church to teach man the use and function of these natural laws, for churchmen are neither trained nor equipped for the purpose. It is, however, the responsi-



"And God saw everything that He had made and, behold, it was very good . . ."

The practice of conservation is, in itself, a part of man's religious obligation. In it final form, conservation is the effort of man to make the laws of natural science function in his environment. These laws have been in existence from the beginning. They were created by God and revealed to man as he studied, searched, and experimented to discover the secrets of the world about him. What man found was an orderly world which, when operating in conformity with systematic laws created by God for its functions, was a never ending program of creativity. The conservation program is

bility of religion to point out man's sins, to hold before him ways of growth in cooperation with God. It is the job of the church to lead men to the understanding that they must, if they are to be truly religious, learn how to be cooperators with God to best fulfill their purpose in life. To offer man his greatest salvation, the church must teach and preach the redemption of every avenue of life. This is the total gospel for total life.

The church and conservation also have a united program in that *the church will only be as good as the resources which surround it.* If

"For, the Lord thy God bringeth thee into a good land . . ."

it is to be a strong, virile organization, it must be surrounded by abundant resources out of which it can reflect a strong message to society. The outreach of the church through its financial aid to missions, religious education, and socially related programs is dependent upon the resources from which it can draw. Poor farms and eroded soil, or depleted forests and worked out mines produce very little for the great outreaching message of the church. Thus, to build the topsoil, replenish the forests, and use our natural resources in the most economical way is to carry on the stewardship, not only of the material things about us, but the projection of the Christian message to the entire world.

Such a program of intercooperation is now being inaugurated in the State of North Dakota. This program is known as "The North Dakota Plan." The manner in which it functions is as follows:

It was conceived and built through the cooperation of the State directors of the district supervisors organization, the Soil Conservation Service, and cooperating clergymen. The plan first recognized that all three of these groups needed an understanding of what each could offer the other in assistance to their respective causes. Upon this basis it took its beginning and developed to become quite workable.

The employees of the Soil Conservation Service work only in advisory capacity to the program itself. The main weight of the work falls upon the shoulders of the district supervisors and the clergy.

The district supervisors, most of whom are churchmen, make the initial contact with the local clergyman who would be willing to cooperate in the district. They present the necessary information, such as copies of lectures, talks, and sermons which have been delivered on the subject to outline the aims and objectives of the program. In addition, the supervisor has a definite responsibility for the minister by offering him a place on the next public program to bring a similar message to the local people.

By making a friend of the minister, the local work unit leader is able to teach some of the practices which are most fundamental to the locality.

It has been my own privilege to work closely with this program and with the men in the movement for the past two and a half years. As a minister I can say that the experience has been one of the greatest in cooperation, enthusiasm for each others' programs, and dedication to a great cause that I have ever seen. The men themselves, like the state conservationist, Lyness G. Lloyd; the state director, Henry Steinberger; the regional vice president, Otis Tossit; work unit leader, Arnold Seim; county extension agent, Earl Sulrude, and members of the State College staff too numerous to mention, have all contributed.

In such a program as this, one can see religion and conservation in action. After such an experience, the real question is not how are they tied together, but how could they be separated?

Tile Solves Problem In Palouse

Interception effected by tile line around wet area on I. A. Zakarison's farm.

Wet bottom lands are being reclaimed by interception of underground water as it flows across clay layer.

By CHARLES T. WEBB and WILLIAM D. HICKMAN

DURING the last few years considerable acreage of potentially high production has been reclaimed in the Palouse area by the use of tile.

In this part of Washington and Idaho, tile is used to intercept the underground water draining from the hilly terrain. Nearly everywhere here, the soil will accept water moderately well down to about 3 or 3½ feet. At this point a tight clay layer is encountered. The excess water seeps into the soil until it strikes the clay layer and then drains off the sloping land just above it. As the slope diminishes the lateral movement of water over this clay layer is lessened. If the drainage area is large the excess water, draining down slope to a comparatively flat area, causes wet spots. The condition may become so serious that the entire draw or flat will be too wet for high production. The end condition is a wet-weather lake, with portions of the flat never drying out sufficiently to crop. This condition makes it very hard to control weeds. It is necessary to fertilize and weed-spray these areas much later than the balance of the field.

To overcome such difficulty, a tile line is laid on the upper side of a wet spot, its purpose being to intercept water draining across the clay layer. To find just where to lay the line, it is best to "prospect" a bit. For this an orchard soil auger is useful.

Laying tile on Cliff Wolf farm, June 1953.

Note.—The authors are soil conservationist, Pullman, Wash. and soil conservation aid, Palouse, Wash., both of the Soil Conservation Service.

A few borings, plus the technician's knowledge of how water behaves in this community, helps to determine the location and depth of the tile line. Nearly all the tile lines in this area are interception systems. Occasionally, however, a deeper vein is encountered and is not eliminated by the interception line. In this case it is necessary to run a spur line directly to the source of water.

The Soil Conservation Service has found that this practice often results in the capability class of the land being raised from Class IV to high-producing Class II. When otherwise poor areas are made productive again, the operator frequently finds it practical to seed his very steep and eroded areas to permanent cover, thus taking another step toward complete conservation.

As laying tile is considered a permanent-type practice by ACP, the SCS is charged with technical responsibility. In many cases the Service will make the layout with grade stakes to indicate the line of the tile and the depth it will be necessary to place the tile in order to keep on grade. In other instances an experienced contractor does the layout job himself, with an SCS technician inspecting the work and completing the ACP papers.

One of the first SCS technicians to establish the proper method of intercepting by tile the excess water draining from the Palouse Hills was Jim Rabdau of Moscow and Genesee, Idaho. More recently, Larry Sorenson, of Idaho, and the authors of this article, of Washington, have assisted the farmers to install the intercepting method on many miles of wet flats.

Parson tile-laying machine being demonstrated on Pat Lynch farm.

Several farmers in the North and South Palouse (Wash.) Soil Conservation Districts have completed the laying of large amounts of tile. In the North Palouse district last year 16,000 feet were laid by Paul Mader and 4,500

Covering tile on Zakarison farm.

feet by I. A. Zakarison. In the South Palouse district, Merle Harlow installed 8,700 feet and Wendell Gwinn put down 8,247 feet.

In most cases the cost is amply repaid by the acres reclaimed.

Merle Harlow, of Pullman, is pleased with his experience: "After putting in tile on the flat north of the house we were able to seed the whole flat to spring grain, something we have not been able to do for many years. The pond at the lower end of the drainage system gives me stock water down where I need it and dries up those three springs near the head of the draws."

Paul Mader, of Palouse and Pullman, Wash. has this to tell: "Tiling reclaims land that is non-productive into the most productive and most desirable land in the field. It cuts down cost of operation by allowing the field to be

Closeup of backhoe in operation, South Palouse Soil Conservation District.

worked as a unit rather than making it necessary to come back later and seed, spray or fertilize these small wet areas. After tiling, no time is lost or machinery broken because you happen to get too close to the wet land and get sucked in. I plan to put in approximately 2 miles of tile per year till all the wet areas are corrected. Tiling will greatly benefit me in 1955 when I plan to pasture 350 acres of sweetclover. The live creek caused by the tiling in this field will furnish water at several places."

Here are a number of points to consider if the tile system is to operate properly:

1. In the Palouse area be sure the tile is laid on, or in the top part of the clay layer. If the tile is above the layer the water will drain down below it and the tile will be useless.

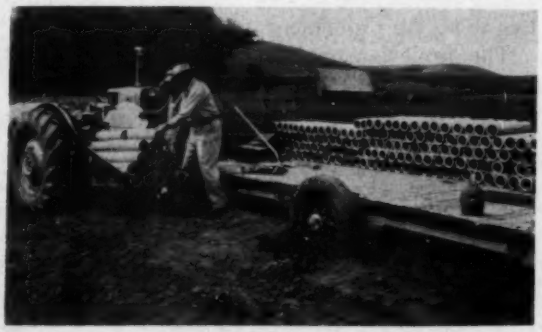
2. Lay the tile properly so that there will not be low places where it will become plugged.

3. It will always be necessary to have an outlet for the tile. A roadside ditch or grassed waterway allows good flow from the tile. Keep brush and growth cleaned away from the end of the line.

4. A solid section of steel or Orangeburg pipe often is recommended at the outlet in order to prevent animals from loosening the short lengths of clay tile.

5. Straw or a strip of tar paper is used over the tile to prevent too much soil from getting in at the joints when backfilling.

6. A screen or grating at the outlet is important, to prevent rodents from entering.



Transfering tile from large cart to wheel tractor for transporting to job

During the recent winter ACP signups, the communities of Pullman and Colton, Wash., representing the southeastern part of Whitman County, requested assistance for over 42 miles of tile. If this is an indication of the demand generally, the tiling program throughout the Palouse will be of tremendous proportions this year of 1954.

STEINBERGER OF NORTH DAKOTA

(Continued from page 271)

State Area Supervisors meeting in the Black Hills of South Dakota, he spoke on "Religion and Conservation." Through Steinberger's efforts, arrangements were made for him to address the last convention of the National Association of Soil Conservation Districts in New Orleans.

A plan to coordinate the programs of district supervisors and churches was developed by this minister and adopted as part of 1954's action program in North Dakota.

Henry Steinberger's activities have not all been in the field of conservation. He organized the White Ash Community Club 7 years ago, has served continuously on the Renville extension advisory board, has helped organize the Renville-Bottineau Counties Agricultural Improvement Association, has served on the advisory committee to the Greater North Dakota Association in developing their annual program, and has assisted in organizing the Renville County Township Supervisor's Association. He was twice elected as official North Dakota State delegate to the national convention. Henry has attributed his success over past years to his good wife, and ardent conservationist, who has encouraged and assisted him in his achievements.

Hats off to an outstanding district supervisor as he continues his work of conserving our Nation's soil!

ENGINEERING FOR AGRICULTURAL DRAINAGE. By Harry Burgess Roe and Quincy Claude Ayers. 501 pp. Illustrated, 1954, New York: McGraw Hill Book Co., $7.50.

The authors have appropriately dedicated this drainage text to the large group of men in the various phases of agriculture earnestly seeking the best practices for the control of soil moisture in crop production. This text shows how good practice in farm drainage is closely allied to soil science, agronomy, farm management and other agricultural sciences. Special stress is laid on soil, soil-moisture characteristics, and plant-moisture relationships. Two excellent chapters are devoted to soils in relation to drainage and water properties of soils.

The basic concepts of rainfall and runoff are discussed to enable the drainage engineer to understand the factors which influence runoff. Data of particular value to the drainage engineer are presented to facilitate estimates of flood flows. The chapter on flow and measurement of water contains the explanation of Chezy-Kutter and Manning's formula and provides tables which enable a solution of ditch flow problems. The text describes the use of various field drainage practices such as intercepting ditches, field drainageways and dead furrows and special types of drains, such as mole drains and vertical drains. Of particular interest is the discussion of the major types of drainage problems.

The design and construction of open ditches receives detailed consideration by the authors. The discussion of drainage surveys should be of particular help in training technicians. This includes quotations and data obtained from numerous other workers. It is this section, in particular, which will provide subject material for debate and for differences in opinion by drainage technicians. For example, the author quotes the late E. R. Jones as recommending in general "there is no proper place for an open ditch with a bottom width less than 4 feet and a maximum flow depth less than 6 feet." In a great many locations smaller ditches are used and it would have been well to discuss such conditions. Another example where further explanation would be desirable is the problem which illustrates the design of an open ditch in which the design proceeds upstream. Probably in most instances it is advantageous to design from the upstream end downward. This is particularly essential where the topography requires the use of more than one drainage coefficient. However, by any standard the authors have done a creditable job in assembling and presenting the empirical procedures used in the design of open ditches.

Examples of drainage plans are provided which serve as a good guide. The text is amply illustrated with figures and photographs that illustrate the principles which are explained. These make for easy reading and understanding. An entire chapter is devoted to open ditch maintenance. Since this practice has been neglected in many locations this emphasis is considered appropriate.

The authors deserve particular credit for the excellent chapters on location, design and construction of underdrains. They cover the principles of movement of ground water through the soil and give a detailed discussion of Neal's formulas and charts for determining depth and spacing of drains. The discussion of drainage of irrigated lands will make the text of particular value in the Western States. The material on soil moisture control of peat and muck soils presents authoritative data not readily available from other sources.

The text contains problems in appropriate chapters, including design of open ditches, tile drains and drainage of irrigated lands. Such problems should be of particular help in enabling technicians having training responsibilities to set up problems for trainees.

The reviewer has known and worked with both authors for many years and wishes to join with other drainage engineers in commending them on a new and comprehensive text for which there is great need. This text will provide a valuable up-to-date reference for the practicing technician as well as a guide for the student. Many engineers spending much of their time in drainage work will, no doubt, do as the reviewer has done and assign the text space in the top drawer of his desk.

—JOHN G. SUTTON

DEVELOPING FARM WOODLANDS. By John F. Preston. 386 pp. Illustrated, 1954, New York: McGraw-Hill Book Co., Rural Activities Series. $4.50

Those familiar with John Preston's "Farm Wood Crops" will find in this volume an even more direct approach to fundamental problems facing 90 percent of the more than 4 million woodland owners. "Developing Farm Woodlands" was prepared to help "students of agriculture." Preston did not consider students as only those located at colleges and universities. He wanted to furnish sound guides to those who would teach and to those who would learn while doing.

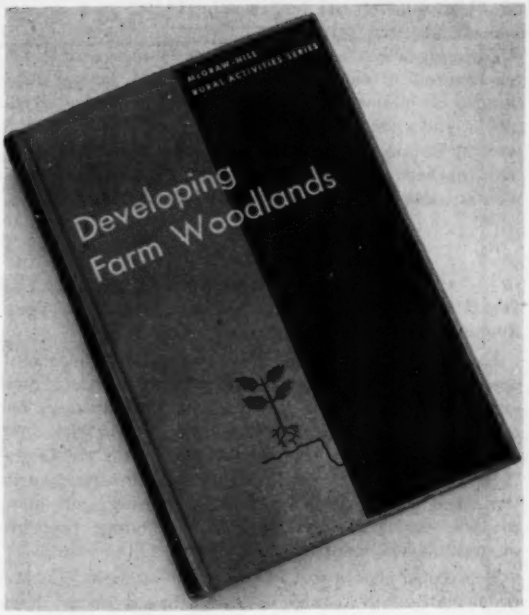
"Growing wood as a farm crop is as much of a farm job as it is a forestry job." Early in his career with the Soil Conservation Service, John Preston established this important basic concept for successful woodland management on farms. He further develops this sound principle of integrated land use in this book.

"Developing Farm Woodlands" should attract "students of agriculture" and all others interested in problems of the use of lands in private ownership. In considering the significant phases of this job, the author treats first things first. In Chapter I, Growing Trees as a Farm Crop, he starts with the landowners, about whom he says "growing wood as a farm crop will not be successful unless the farmer is wholeheartedly in favor of it." Then he discusses the next most important factor, the land—pointing out that the capability of the land for growing a wood crop is the first item to be considered by the landowner.

It is only necessary to look at the subsequent chapter headings, Starting a Farm Forest, Weeding and Releasing Young Trees, Thinning Tree Crops, Pruning Tree Crops, Cutting the Wood Crop, Marketing Wood Products, and the last three chapters—Managing Farm Woods for Maple Sap, Christmas Trees, and Naval Stores—to see that trees are the plants and wood is the primary crop being considered. Also, the forester will recognize the logic of this sequence, and, upon further investigation, the soundness of the advice presented without too much mysticism.

Of course, there will be the few "purists" who will question general rules for thinning, spacing rules, time to start thinning, amount to cut, etc. Yet, these guides if followed will not result in overcutting, degrading the stand, or decreasing the productive capacity of the site. Rather, they will lead the farmer, or the "student" who will later teach the farmer, to develop his woodland into an integral part of his farm business.

In addition to the many illustrations that add both interest and understanding to the discussions, each chapter is concluded with a list of supplementary activities. For example, at the end of the chapter on Cutting the Woodcrop, these activities are discussed: pacing, measuring trees, marking timber for an improvement cutting, and cruising a stand of timber. Each of these is a clearly presented set of instruction for the layman's use. All supplementary activities are jobs that the farmer can learn to do for himself. "His skill in developing his woodland will increase as he continues to cut."



The author is a realist, as are most farmers, especially about growing crops, and therefore he recognizes the hazards to growing wood crops. However, unlike many foresters, he does not dwell at length, and in fearful tones, on those hazards. For example, of fire he says: "Fire protection is one of the musts of growing wood. Investments of time and money in the development of the woodland are not worth while if the productive power of the forest soil is to be reduced by recurring fires." That sounds like a soil conservationist talking to a wheat farmer—the calm, positive and intelligent approach, rather than the emotional, flag waving, hell-fire and brimstone type. After all, farmers are accustomed to considering the costs of protecting their crops against losses from many enemies, and will ordinarily do it if they know the enemy and know that the cost-benefit ratio is favorable to them. One of the wheat states has five times as much wheatland burned over each year as one of the largest timber producing States has burned by forest fires. Yet, the wheat farmers continue to protect against fire, and continue to plant wheat—they know their cost-benefit ratio.

The advantages of the farm woodland owner over the non-farm woodland owner in growing a wood crop appear to be over-emphasized. This volume is primarily devoted to the many opportunities of the farmer to use profitably his woodland to grow a wood crop. There is enough discussion, directly or by inference, of problems of the non-farm woodland owner to raise questions as to the economic feasibility of his growing a wood crop. I would suggest the students' critical appraisal of these disadvantages for the non-farm woodland owner. Modern technologies have altered wood utilization standards to such a great degree that many of these disadvantages have either disappeared or have shifted to

the right side of the ledger—maybe not quite as far over as for the farmer.

The appendices are an excellent complement to the ten chapters of discussion. They contain, among other things, a bibliography, glossary, volume and yield tables, and a very complete summary of forest taxation laws by states. They should be of considerable help to both teachers and students of land use—especially those who are interested in developing farm woodlands.

—T. B. PLAIR

IRRIGATION DEVELOPMENT AND PUBLIC WATER POLICY. Roy E. Hoffman, 336 pp. 1953. New York: Ronald Press Co., $6.50.

This is an excellent analysis of the social and economic aspects of irrigation agriculture, pointing out the growth and development of irrigation in the United States and how it fits into the public land policy. This book deals with the establishment and status of water rights and their administration, emphasizing the numerous variations and complexities involved, and brings out many modern concepts of water use, including multiple-purpose development by river basins.

This book should aid in arousing interest in water problems by the average citizen, since it brings home forcibly the numerous reasons why *all* citizens—not only the farmers and ranchers of the Western States—are involved in these problems.

Those interested in the orderly growth of irrigation in the humid areas should benefit greatly from this book. It summarizes new developments and sets forth clearly the lessons that can be learned from past experience and points out the hazards involved in irrigation work. It emphasizes the need for more adequate water laws in the Eastern States if irrigation in this area is to reach its maximum potential.

After discussing various numerous and complex factors involved in irrigation, the author sets forth 20 important components that are required for a sound irrigation policy in the United States.

An excellent bibliography on this and related subjects is included.

Professor Huffman was formerly with the Great Plains Water Conservation and Utilization Program of the U. S. Department of Agriculture and now teaches agricultural economics at Montana State College. He is also the author and co-author of numerous articles, research studies, and reports which have appeared in leading irrigation journals. He has kept in close contact with current problems in the field as a member of the Missouri Basin Regional Research Committee, and as a consultant to the Missouri Basin Survey Commission.

—T. H. QUACKENBUSH

TEXTBOOK.—"Nevada Conservation Adventure," a textbook that is written in adventure story form, will soon be distributed to all Nevada schools. The volume is being financed jointly by the State Department of Public Instruction, the Nevada Fish and Game Commission, and other State agencies.

This is the second such book written by the Nevada Conservation Textbook Committee, and it is designed for use in the seventh and eighth grades. The new text is an outgrowth of a request from the Nevada Federated Sportsmen, an affiliate of the National Wildlife Federation, that conservation education be intensified in the State's schools.

JACOBSEN OF CALIFORNIA

(Continued from page 273)

directors. We are paying for and doing the work, to a very large extent, by ourselves, without large federal expenditures. Conservation problems do not stop at your neighbor's fence, and through district operation, overall planning and cooperation is possible and practical. We who have been active and close to this work for several years feel that it is the most effective, democratic approach to the vital problems of soil and water conservation yet devised."

Jake has in mind the fundamental idea of the "stewardship of the land"—the obligation to leave the young people of the community a richer, more productive soil. This, together with the strength and vision of America's youth, he feels, means a stronger and more stable foundation for our nation's future economy.

—ROY E. BALLARD

NATIONAL BOY SCOUT AWARDS.—The United States Departments of Agriculture and Interior will make individual and unit awards to Boy Scouts who participate in the Boy Scout good turn conservation program for 1954 which began officially on March 21.

Twelve Scouts who make outstanding contributions to the program will be selected to receive certificates of national conservation achievement. The certificates will be presented to the Scouts by President Eisenhower when they report to him during Boy Scout Week in 1955. President Eisenhower, a member of the Boy Scout Executive Board, suggested the conservation effort to the scouts.

All units actively participating in the good turn program will receive a certificate signed by the Secretary of the Interior and the Secretary of Agriculture.

The programs carried on by individuals or units may include such projects as building a farm pond, planting trees, seeding highway embankments, cleaning up litter in a public park, planning an exhibit or showing movies to stimulate interest in conservation.

SOIL CONSERVATION

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